Amendments to the Claims

This listing of claims will replace all prior version and listings of claims in the application:

Listing of Claims:

1. (Currently amended): A method [[of]]for detecting a microorganism ~~cDNA comprising~~ in a specimen comprising the steps of:

~~(a) amplifying the microorganism cDNA with bioactive primers;~~

~~(b) hybridizing the microorganism cDNA with microorganism-specific probes in hybridization tube wherein the probe linked to magnetic bead;~~

~~(c) transferring hybridization tubes to magnetic wells for washing;~~

~~(d) adding blocking solution into the tubes;~~

~~(e) adding avidin enzyme complex or streptavidin enzyme complex into the tubes, wherein the enzyme reacts with a luminescence emission substrate;~~

~~(f) performing washing reaction to remove interfering material by the aid of magnetic field;~~

~~(g) suspending magnetic beads; and~~

~~(h)detecting a light emission change utilizing the luminescence emision substrate; and~~

~~(i) comparing the light emission change in step (h) to a light emission change of a control sample~~

(a) extracting genomic DNA from the specimen;

(b) performing the first polymer chain reaction (PCR) with an outer pair of primers using the genomic DNA as a template to obtain the first PCR DNA product;

(c) performing the second PCR with an inner pair of primers using the first PCR DNA product as a template to obtain the second PCR DNA product;

(d) hybridizing the second PCR DNA product with a probe attached to magnetic beads to obtain hybridized DNA fragments in a reaction container, in which the probe comprises a nucleotide sequence specific for, and is capable of, hybridizing with the second PCR DNA product; and

(e) removing unbound material and non-specific PCR products while subjecting the reaction container to a magnetic force; and

(f) detecting hybridized DNA fragments to determine whether microorganism DNA is present in the specimen,

wherein each pair of the primers include respective forward and reverse primers, and each primer comprises a respective nucleotide sequence that is complementary to the genomic DNA of the microorganism, and the inner pair of primers bind to the first PCR DNA product.

2. (Previously presented): The method of Claim 1, wherein the microorganism is *Mycobacterium tuberculosis*.

3. (Currently amended): The method of ~~Claim 1, wherein the microorganism cDNA are obtained from the PCR amplification mediated by bioactive primers~~ Claim 2, wherein the outer pair of primers comprise the nucleotide sequences set forth by TGAGGGCACGAGGTGGCA (SEQ ID NO: 8) and CGTAGGCGTCGGTCACAA (SEQ ID NO: 9), and the inner pair of primers comprise the nucleotide sequences set forth by GATGCACCGTCGAACGGC (SEQ ID NO: 10) and CCACGTAGGCGAACCCT (SEQ ID NO: 11), respectively.

4. (Currently amended): The method of Claim 1, wherein ~~the streptavidin-enzyme complex in the step (e) is streptavidin horseradish peroxidase (SA-HRP)~~ at least one of the inner pair of primers is labeled with a labeling agent.

5. (Currently amended): The method of ~~Claim 1, wherein the step (g) suspending magnetic beads is performed by vortexing the tubes~~ Claim 4, wherein the labeling agent is biotin.

6. (Currently amended): The method of ~~Claim 1, wherein the detection of the step (h) is performed by luminometer or spectrophotometer~~ Claim 4, wherein the labeling agent is selected from the group consisting of biotin, fluorescent molecules, radioactive molecules, chemiluminescent molecules, and chromogenic molecules.

7. (Currently amended): The method of ~~Claim 1, wherein the steps (a) (h) are performed in the same tube~~ Claim 2, wherein the probe comprises the nucleotide sequence set forth by amine-TAACCGGCTGTGGGTAGCAG (SEQ ID NO. 7).

8-10. (Canceled).

11. (Currently amended): A ~~system for performing detection of microorganism cDNA comprising~~ diagnostic kit for detecting a microorganism in a specimen comprising:

(a) a microorganism-specific probe ~~linked to a~~ attached to magnetic beads;

(b) ~~bioactive~~ an outer pair and inner pair of primers for performing the first and the second PCR, respectively, wherein at least one of the inner pair of primers is labeled by a DNA labeling agent;

~~(c) a luminescence emission substrate;~~

~~(d)~~ (c) an avidin ~~enzyme complex~~ or streptavidin- enzyme complex~~, wherein the enzyme is capable of reacting with the luminecensce emission substrate.~~; and

(d) an enzyme substrate for the avidin or streptavidin-enzyme complex,

wherein each pair of the primers include respective forward and reverse primers, and each primer comprises a respective nucleotide sequence that is complementary to genomic DNA of the microorganism.

and wherein the probe comprises a nucleotide sequence that is complementary to a DNA fragment from the second PCR using the inner pair of primers.

12. (Currently amended): The ~~system~~ kit of Claim 11, wherein the ~~bioactive primers are made by reacting DNA labeling reagent with the primers~~ avidin or streptavidin-enzyme complex is avidin or streptavidin horseradish peroxidase complex.

13. (Currently amended): The ~~system~~ kit of Claim [[12]]11, wherein the DNA labeling reagent is a compound having a formula:
FU-BE-D
wherein Fu represents a Furocoumarin compound selected from the group consisting of angelicin compound and psoralen compound;
wherein BE represents none or a binding enhancer selected from the group consisting of C4-12 alkyl, alkyenyl, polyalkylamine and polyethylene glycol; and
wherein D represents a detectable group selected from the group consisting of[[:]] biotin,[[fluorescence]]fluorescent molecule, acridinium ester and acridinium-9-carboxamide.

14. (Currently amended): The ~~system~~ kit of Claim [[12]]11, wherein the DNA labeling reagent is ~~9-(4"-(Aminomethyl)-4', 5"-Dimethyl-angelicin) acridinium carboxamide~~ biotin, or aminomethyl-4, 5'-dimethylangelicin) acridinium carboxamide.

15-20. (Canceled).

21. (New): The kit of Claim 11, wherein the outer pair of primers comprise the nucleotide sequences set forth by TGAGGGCACGAGGTGGCA (SEQ ID NO: 8) and CGTAGGCGTCGGTCACAA (SEQ ID NO: 9), and the inner pair of primers comprise the nucleotide sequences set forth by GATGCACCGTCGAACGGC (SEQ ID NO: 10) and CCACGTAGGCGAACCCT (SEQ ID NO: 11), respectively.

22. (New): The kit of Claim 21, wherein the probe comprises the nucleotide sequence set forth by amine-TAACCGGCTGTGGGTAGCAG (SEQ ID NO. 7).

23. (New): The method of Claim 5, wherein the detecting step further comprises the steps of:

(a) reacting the hybridized DNA fragments with an avidin or streptavidin-enzyme complex and an enzyme substrate for the avidin or streptavidin-enzyme complex; and

(b) reading luminescence.

24. (New): The method of Claim 23 further comprising the step of quantifying the genomic DNA of the microorganism in the specimen by determining relative light units (RLU).

25. (New): The method of Claim 1, wherein the specimen is selected from the group consisting of sputum, serum, cerebral spinal fluid (CSF), and pleural effusion.

26. (New): The method of Claim 1, wherein the hybridizing and removing steps are performed in an apparatus having a means for providing the magnetic force only to the removing steps.

27. (New): The method of Claim 1, wherein each of the primers contains nucleotides that are free of ribose.